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Fillmore, UT 84631-5504
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Millard County Commission

www.millardcounty.org



Satellite Offices - Delta
71 South 200 West - P.O. Box 854
Delta, UT 84624
Phone: (435) 864-1400
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Division of
Solid and Hazardous Waste

APR 30 2012
2012-003096

April 24, 2012

Matt Sullivan
Environmental Scientist
Utah Division of Solid and Hazardous Waste
195 North 1950 West, 2nd Floor
P.O. Box 144880
Salt Lake City, UT 84114-4880

RE: Millard County Landfill Permit # 9431

Dear Mr. Sullivan:

Please find enclosed revised permit application for the Millard County Class I Landfill.

With the new post-closure figures from Jake Russell, of Geo-Logic Associates of Grass Valley, California, we will have a total savings of \$141,717 over the 30 years required monitoring for the landfill. We didn't realize until recently the original \$9,350 figure for post-closure was an annual amount which equaled \$280,500 over thirty years without inflation.

With the new figures for post closure, the total for Closure, Post-Closure is \$931,921 as of today date. We have remitted \$250,000 to the PTIF Account # 2436. This makes our deficiency \$355,740 in the PTIF account. We will remit \$50,000 to the fund annually until the fund balance is sufficient to meet closure, post-closure costs by the end of the landfill project.

The Board of Millard County Commissioners met in regular session on Tuesday, April 17, and approved the proposal.

Thank you for your consideration.

Sincerely,

James I. Withers, Chairman
Board of Millard County Commissioners

sld

enc.

**APPLICATION FOR
RENEWAL OF PERMIT
TO OPERATE
A CLASS I MUNICIPAL SOLID WASTE FACILITY
AT THE
MILLARD COUNTY LANDFILL**

Division of
Solid and Hazardous Waste

APR 30 2012

2012-003086

Prepared for:
Millard County
71 South 200 West
Delta, Utah 84624
(435) 864-1400

March 2011

Prepared by Sheryl L. Dekker
Director of Operations
Millard County Solid Waste Department
71 South 200 West
P.O. Box 854
Delta, UT 84624
Phone: (435) 864-1400
Fax: (435) 8641404
e-mail: sdekker@co.millard.ut.us

EXECUTIVE SUMMARY

The Millard County Landfill is located approximately six and three-tenths (6.3) miles southeast of Delta in Millard County and serves the residents and businesses of the County. The landfill is an existing Class I facility which must be in regulatory compliance with the Utah Solid Waste Permitting and Management Regulations (Utah Administrative Code R315-301-320 Revised October 15, 2003). Based on the information presented in this renewal application, along with the original application, Millard County requests that a Permit to Operate a Class I Landfill be granted by the Utah Department of Environmental Quality for the continued operation of the Millard County Landfill.

Please refer to Millard County's original application for a Permit to Operate a Class I municipal solid waste disposal facility at the Millard County Landfill, which consists of a Plan of Operation, Closure and Post-Closure Plans, a Geohydrological Assessment, and Engineering Report. The application was prepared in accordance with R315-310-4 of the Utah Administrative Code, and the outline contained in the Application for a Permit to Operate a Class I or Class V Landfill provided by the Utah Department of Environmental Quality.

In November of 1994, an Application for a Waiver from Ground Water Monitoring and Liner Requirements at the Millard Landfill was submitted to UDEQ (Utah Department of Environmental Quality) for consideration. The waiver application is considered an integral part of the original application, and provides a large portion of the information contained in geohydrological assessment as required by the Utah Administrative Code (UAC) R315-310-4(2)(b). The waiver is included with the original application as Appendix E. Related correspondence for UDEQ regarding the content of the waiver application and the issuance of such waiver is also included in Appendix E.

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Appendix A:	Current Operating Permit attached
Appendix B:	Land Use Zoning Documents attached
Appendix C:	Landfill Property Deed attached
Appendix D:	Record keeping and Inspection Forms attached
Appendix E:	Application for Waiver from Ground Water Monitoring and Limer Requirements at the Millard County Landfill, Submitted to UDEQ November 1994, related correspondence and Response to Request for Additional Information from UDEQ. attached
Appendix F:	Loading Rate Calculations attached
Appendix G:	Correspondence from Utah Division of Water Rights attached
Appendix H:	Drainage Report attached
Appendix I:	Conceptual Design Drawings attached

List of Drawings:

- Drawing A-1: Title Sheet and Site Vicinity Map
- Drawing B-1: U.S.G.S. Harding Quadrangle
- Drawing B-2: Existing topography / Existing and Proposed Facilities
- Drawing B-3: Most recent U.S. Geological Survey topographic map, 7-1/2 minute series, showing the waste facility boundary; the property boundary; surface drainage channels; any existing utilities and structures within one-fourth mile of the site; and the direction of the prevailing winds (R315-310-4(2)(a)(ii))
- Drawing C-1: Conceptual Closure Design
- Drawing C-2: Cross Sections A-A' through C-C'
- Drawing C-3: Cross Sections D-D' through J-J'

Drawing D-1: Details

PART I - GENERAL DATA

UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY

DIVISION OF SOLID AND HAZARDOUS WASTE

APPLICATION FOR A PERMIT RENEWAL TO OPERATE A CLASS I OR CLASS V LANDFILL

The application shall submit, in duplicate and original permit renewal application, a general report and a technical report to:

Scott T. Anderson, Director
Division of Solid and Hazardous Waste
Utah Department of Environmental Quality
P.O. Box 144880
Salt lake City, UT 84114-4880

PART I - GENERAL DATA

1. **Name of Facility:** *Millard County Landfill*
2. **Site Location:** *N ½, SE ¼, Sec 24, T17S, R6W, SLBM
5784 East 2160 South, Delta, Utah 84624
6 miles SE of Delta and ½ mile east of Hwy 50*
3. **Facility Owner:** *Millard County*
4. **Facility Owner:** *Millard County*
5. **Contact Person:** *Sheryl Dekker
Landfill Operations Manager*

Address: *71 South 200 West
P.O. Box 854
Delta, Utah 84624*

Telephone: *(435) 864-1400*

Fax: *(435) 864-1404*

e-mail: *sdekker@co.millard.ut.us*
5. **Type of Facility:**
 - Class I Landfill
 - Permit Renewal
Original Permit Number 9431

6. Property Ownership:

- Presently owned by applicant

7. Certification of Submitted Information:

Official: James I. Withers
Title: Chairman, Millard County Commission

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: James I. Withers Date: 4-24-12
James I. Withers

SUBSCRIBED AND SWORN to before me this 24TH day
of APRIL, 2012

Sheryl L. Dekker

My Commission Expires on the 2ND day of AUGUST, 2015.



NOTARY PUBLIC
SHERYL L. DEKKER
Commission # 612369
Expires 08/02/2015
STATE OF UTAH

PART II - GENERAL REPORT

1. INTRODUCTION

The Millard County Landfill is located approximately six and three/tenths (6.3) miles southeast of Delta City in Millard County, Utah, as illustrated in Drawing A-1, Appendix I (Title Sheet and Site Vicinity Map). The site is an existing landfill which accepts approximately 20 to 25 tons of waste per day, and is therefore a Class 1 facility as defined by the Utah Solid Waste Permitting and Management Rules (UAC R513-301-2). The site is currently operating under Utah Solid and Hazardous Waste Control Board Solid Waste Permit # 9431 which was issued August 1, 2006. This permit expires at midnight July 31 2011. A copy of the permit is attached in Appendix "A" of Millard County's application.

1.1 Types of Waste Received

The Millard County Landfill accepts the following waste types for disposal or recycling:

- household/private;
- commercial;
- industrial;
- construction/demolition;
- dead animals;
- white goods;
- automobiles;
- tires;
- medical waste;
- asbestos;
- yard wastes; and,
- household hazardous wastes.

The anticipated daily volume is 35 tons per day according to historical annual records. The procedures and disposal methods of these various waste types are described in Section 2.3 of this report.

1.2 County Solid Waste Management Plan

The landfill is an integral element of the Millard County Solid Waste Management Plan. The facility accepts all of the solid waste generated from three principal service areas:

- The eastern portion is comprised of those communities along the I-15 corridor which includes the incorporated towns of Scipio, Holden, Fillmore, Meadow and Kanosh and the unincorporated areas of the county east of McCornick
- The central portion is comprised of the communities situated along the Sevier River Basin which includes the incorporated towns of Leamington, Lynndyl, and Oak City. Delta and Hinckley, along with the unincorporated areas west of McCornick which

includes the townships of Oasis, Deseret, Abraham, and Sutherland, and the ranching and farming communities in that portion of the county.

- The western portion includes the western ranching and farming communities around the unincorporated communities of Garrison, Gandy and Eskdale.
- The Landfill serves all of Millard County which has a population of 12,503 according to the 2010 census.

1.3 Property Description and Ownership

As described by the Public Land Survey system and illustrated on Drawing B-1 (Appendix I), the Millard County Landfill occupies the N1/2, SE1/4, Sec. 24, T.17S., R6W., Salt lake Base and Meridian (SLB&M). The latitude and longitude of the entrance to the facility, at the southwest corner of the northeast quarter of the southeast quarter of Section 24, are estimated as 39°19'14" and 112°28'17", respectively.

The property is in an area which has a land use/zoning designation of AG-20 (Agriculture-20 acres). The Board of Millard County Commissioners passed Ordinance # 08-04-14 on April 15, 2008 amending the official zoning map of Millard County which changed the zoning to AG-20. The Millard County Landfill is currently recognized as a legal nonconforming use. However, the Planning Commission is currently in the process of amending the existing Land Use Ordinance and will amend the matrix to allow for a non commercial Class I landfill in the AG-20 zone subject to a conditional use permit. A copy of the supporting documentation is included in Appendix B.

The Landfill property was deeded to Millard County by the Bureau of Land Management on August 23, 1995. The deed was recorded with the Millard County Recorder's Office September 25, 1995 (Attachment C).

2.0 PLAN OF OPERATION

Millard County is submitting the following Plan of Operation for a Class I municipal landfill at the Millard County Landfill as required by the Utah Solid Waste Permitting and Management Rules, R315-301 through R315-320 of the Utah Administrative Code (UAC) Solid Waste Rules as the Solid Waste Management Authority for Millard County, and conforms to UDEQ regulations governing solid waste sites and facilities. This Plan of Operation is submitted as part of an application for a permit to operate a Class I site, as required by UAC 315-310-4 of the UAC.

The Millard County Landfill is owned and operated by Millard County. The business office is located at 71 South 200 West, Delta, Utah. The Plan of Operation shall be retained at the Millard County Offices in Delta. The responsibility for compliance with the plan shall be that of the Operations Manager and the Landfill Supervisor. A copy of the plan shall be available for review by employees involved in daily operations, as well as to regulatory agencies and other parties, as requested.

Prior to the implementation of operational modifications, regulatory requirements shall be assessed to ensure that compliance criteria are satisfied. Waste management practices not included in this Plan of Operation shall be submitted to Utah Department of Environmental Quality (UDEQ) prior to implementation. These may include expansion of services or changes in disposal areas within the property boundary. Approved requests for modifications in operational standards and practices shall be incorporated into the Plan of Operation upon final approval by the Utah Department of Environmental Quality.

2.1 Hours of Operation

The Millard County Landfill is open to the public from 10:00 a.m. to 6:00 p.m. during the spring and summer months, and from 9:30 a.m. to 5:30 p.m. during the fall and winter. The time changes take effect when daylight-saving time changes occur. The Landfill is open Monday through Saturday, 313 days per year. There will be a landfill attendant on-site at all times during the operating hours.

2.2 Schedule of Construction

The Millard County Landfill utilized excavated trenches for solid waste disposal. The facility is currently filling the eighth trench excavated since the opening of the Landfill in 1986. The first trench was located along the eastern boundary of the site. Trenches are being excavated from east to west across the property. Based on current and projected incoming waste volumes and trench sizes, a new trench is required approximately every three years. The current trench is projected to last for approximately three more years. Drawing B-2 (Appendix I) illustrates the conceptual phased construction across the landfill property.

2.3 Names and Addresses of all Property Owners within 1,000 Feet of the Facility Boundary

Quality for Animal Life, Inc
6037 Highland Drive, Ste.1
Holladay, UT 84121

Robert E. Bliss, JT
818 Bristlecone Lane
Delta, UT 84624

Revolution Dairy, LLC
818 Bristlecone Lane
Delta, UT 84624

Bliss Insurance, LLC
c/o Revolution Dairy, LLC
P.O. Box 848
Delta, UT 84624

Duckworth Dairy,
4690 E 3000 S
Delta, UT 84624

2.4 Waste Handling Procedures

UAC R315-302-2 requires that a plan for operating a Class 1 landfill must provide for a description of on-site solid waste handling procedures during the active life of the facility. The Millard County Landfill accepts the following types of waste for recycling or disposal:

- household/private;
- commercial;
- industrial;

- construction/demolition;
- dead animals;
- white goods;
- automobiles;
- tires;
- medical and asbestos wastes;
- yard wastes; and,
- household hazardous wastes.
-

The Millard County Landfill does not accept the following types of waste:

- liquid waste;
- hazardous/PCB wastes; and,

All incoming vehicles are met by the landfill attendant. Load inspections are performed on a random basis. All incoming waste shipments are recorded on the "Daily Activity Log" form, a copy of which is contained in Appendix D. Recorded information includes vehicle type, license number, load volume estimate, date, time, and the name of the waste hauler (if possible). Waste volumes are estimated based on vehicle and load size. Landfill signs direct incoming traffic to either the active disposal area or the flesh pit location. The majority of the waste received at the landfill arrives via County or commercial collection vehicles. The general public is not allowed access to the active face. Private haulers are directed to discharge their loads in a public discharge area near the active face. Landfill personnel transport the discharged load to the active face for disposal.

The equipment used at the facility includes a Caterpillar 916 steel-wheeled compactor, a scraper, front-end loader, and a track dozer. A front-end loader is available on request from the county road department. The handling procedures used at the facility for accepted types of waste, as well as the screening procedures used to prevent prohibited materials from entering the landfill, are described in the following sections.

2.4.1 Household and Commercial Wastes

Household wastes consist of any solid waste derived from households, including garbage, trash, and sanitary wastes. Household sources may include single and multiple family residences, hotels, motels, bunkhouses, ranger stations, crew quarters, campgrounds, picnic grounds and recreation areas used during the daytime. Commercial wastes are those wastes which are nonindustrial in nature and include solid waste generated by stores, offices, restaurants, warehouses, and other non-manufacturing activities, excluding residential and industrial wastes.

Collection and disposal services for household and commercial wastes are provided by Millard County at twelve transfer stations throughout the county, and by two commercial collectors/haulers that provide curbside residential pickup. The majority of the management of the municipal waste stream consists of the collection and disposal of household and commercial

wastes. Incoming waste from county and commercial haulers is received at the active face, typically on the south end of each trench. The waste is discharged and spread in layers not exceeding two feet in thickness, and compacted using multiple passes of a steel-wheeled compactor. Private haulers are directed to an unloading area near the active face. Discharged loads are moved from the unloading area to the active face by landfill personnel and equipment. As described in this Plan of Operation, all aspects of household and commercial waste management at the Millard County Landfill are performed in accordance with appropriate federal and state regulations.

2.4.2 Industrial Wastes

The majority of industrial wastes generated in Millard County are disposed of on the generator's property. Certain industrial wastes may be disposed of at the Millard County Landfill with the prior approval of the County. The approval process is based on the waste type, quantity, and related analytical data, if required. Hazardous waste generators use the services of permitted hazardous waste facilities outside Millard County (Stansbury, 1993).

2.4.3 Construction/Demolition Wastes

Construction/demolition wastes generated within the western portion of Millard County are disposed of at the Millard County Landfill. The waste is dumped in the northeru end of each disposal trench and periodically compacted and covered to prevent uncontrolled fires and rodent or vector harborage.

2.4.4 Dead Animals

Dead animals are deposited in an excavated trench referred to as a "flesh pit," which is situated in the northwest corner of the landfill property. Dead animals are covered upon arrival or at the end of the work day with a minimum of six inches of soil.

2.4.5 White Goods, Automobiles, and Tires

White goods, automobiles, and scrap metal are stockpiled on-site at the Millard County Landfill. They are periodically removed by an automobile crushing and recycling service. Tires are accepted at the face of the trench pit in maximum allotments of three from private individuals only. No tires are accepted from commercial tire dealers and no tires are stockpiled at the landfill for recycling purposes. Refrigerators will not be accepted at the Millard County Landfill without certification that the Freon has been removed. The Landfill staff includes two certified individuals who remove the Freon from private deliveries of refrigerators.

2.4.6 Yard Wastes

Yard wastes may include tree and brush trimmings, grass clippings, straw and hay, and wastes from seasonal or special events. These are accepted at the facility and are deposited in the north end of each trench with construction/demolition waste.

2.4.7 Household Hazardous Wastes

Millard County currently does not have a household hazardous waste program. The majority of household hazardous wastes, such as residuals in cleaning supply containers, are managed as part of the municipal solid waste stream. Used automotive batteries are not accepted at the Millard County Landfill. They are directed to retail stores where they are accepted for an exchange value when purchasing a new battery. Waste motor oil and antifreeze are collected by local service stations. These products are periodically picked up by a licensed used oil service.

2.4.8 Medical Waste

Medical and infectious wastes from medical facilities are accepted at the Millard County Landfill. Medical wastes generated at the Delta and Fillmore Community Medical Centers are delivered directly to the facility at which time the landfill operator places the waste containers at the bottom of the active face and immediately covers them with twelve inches of earth or waste material which does not contain infectious waste. The waste containers will not be compacted until they are covered.

2.4.9 Asbestos Waste

Asbestos wastes will be accepted at the Millard County Landfill if the following conditions are satisfied:

- the asbestos waste must be adequately wetted and containerized to prevent fiber release; and,
- the waste containers are labeled with the name of the waste generator, the location where the waste was generated, and tagged with a warning label that conforms to the requirements of 40 CFR Part 61.149(2).

Upon receipt of asbestos waste, the operator shall:

- verify the quantities of waste received, sign off on the waste shipment record, and send a copy of the waste shipment record to the generator within 30 days;
- require vehicles that have transported asbestos waste to be marked with warning signs as specified in 40 CFR Part 61.149;
- inspect the load to verify that the asbestos waste is properly contained in leak-proof containers and labeled properly;
- place asbestos containers at the bottom of the active face with sufficient care to avoid breaking the containers;
- cover the waste within 18 hours with a minimum of six inches of material that does not contain asbestos, or, if the waste is not properly containerized, cover immediately with six inches of material that does not contain asbestos; and,
- limit access to the asbestos disposal area until the waste has been covered with six inches of material which does not contain asbestos.

If the operator believes that the asbestos waste is in a condition that may cause significant fiber release during disposal, the operator will notify the local health department and the Executive Secretary. If the wastes are not properly containerized, and the landfill operator accepts the load, the operator shall thoroughly soak the asbestos with a water spray prior to unloading, rinse out the truck, and immediately cover the waste with six inches of non-waste material which prevents fiber release prior to compacting the waste in the landfill.

2.4.10 Liquid Waste Exclusion Program

Liquid waste management procedures are in place at the Millard County Landfill. In accordance with UAC R315-315-5(1), sewage sludge, septic tank pumpings and raw sewage are not accepted at the facility; only dry waste is allowed. Liquids which are in bulk or not in containers are not permitted for disposal in the landfill unless the waste is non-septic household waste. To qualify for acceptance, liquid-filled containers must be part of the household waste stream, small and similar in size to a container which would normally be found in household waste (five gallons or less), and must be designed to hold liquids for uses other than storage.

Operational elements of the liquid waste management program include waste stream observation and separation, and container management. The waste haulers are the first line of defense against liquid waste disposal, followed by the landfill attendants and equipment operators. All landfill staff is trained to recognize liquid-filled containers which may require segregation from the waste stream. In the event that a suspect container is observed, the spotter (hauler, landfill attendant, or equipment operator) will determine whether or not the container is empty. Only empty, vented containers which do not contain hazardous materials are accepted for disposal. In order to dispose of suspect containers or materials, the generator must be able to provide documentation of a nonhazardous designation upon request. Accepted containers may not have more than two percent (2%) grease in them. Operators are instructed not to open containers without first checking with a field supervisor.

Containers which do not meet the criteria described above will be removed from the waste stream and returned to the generator. If the generator is unknown and the container is not empty, it will be stored in a designated fenced area until a hazardous waste determination can be performed by trained personnel. If the contents are determined to be nonhazardous, they will be mixed with soil and the soil and container will be disposed of on-site. If the contents are determined to be a hazardous waste, arrangements will be made by the landfill operator with a licensed transport and disposal facility to remove the container from the landfill premises. Notations will be made to the operating record that includes a complete description of the actions taken and the final decision to accept or reject a suspect load. The record will also contain a complete description of the generator, including name and vehicle description. In the event of a hazardous waste determination, the Division of Solid and Hazardous Waste will be contacted.

2.4.11 Hazardous/PCB/Waste Exclusion Program

Pursuant to UAC R315-315-7, an owner or operator shall not knowingly dispose, treat, store, or handle hazardous waste or waste containing PCB. Owners/operators of all municipal solid waste landfills must implement a program for detecting and preventing the disposal of regulated hazardous waste as defined in Title 40 of the Code of Federal Regulation (40 CFR)

Part 261. The waste exclusion program must also be applied to polychlorinated biphenyl (PCB) wastes as defined in 40 CFR Part 761. In addition, the Plan of Operation for a facility must include a description of procedures for excluding the receipt of hazardous waste or waste containing PCBs. Millard County will implement a series of internal procedures to satisfy this regulatory requirement. These procedures are outlined below.

2.4.12 Random Inspection of Incoming Loads

Incoming loads will be randomly selected to be visually inspected by landfill attendants and equipment operators who are trained and qualified to identify regulated hazardous or PCB wastes. The number of inspections will be approximately one out of every twenty loads, or approximately 1 percent of all incoming loads, which is a minimum benchmark. These loads will be inspected for free liquids and hazardous or PCB wastes. Inspections will be performed at the public discharge area by qualified personnel prior to transfer to the active face. Loads suspected of containing a high liquid content will be tested on-site by EPA Method 9095, paint filter test. Any loads failing the test will be rejected.

Load inspections and decisions which determine whether a material suspected of being hazardous, can be accepted for disposal will be made as follows:

- the waste will be unloaded in an area near, but immediately adjacent to the active portion of the trench;
- the hauler will be required to wait until the content of the load is verified;
- the waste will be carefully spread for observation using a dozer or front end loader;
- containers with contents that are not easily identifiable, such as unmarked 55-gallon drums, will be separated if a visual inspection determines that such movement will not cause the drum to open, and will be opened and inspected only by properly trained personnel; and,
- if the waste is determined to be acceptable, it may be transferred to the working face for disposal.

Tests for characteristics of hazardous wastes typically include TCLP (Toxicity Characteristic Leaching Procedure) and tests for corrosiveness, flammability, and reactivity. Wastes that are suspected of being hazardous will be handled and stored as a hazardous waste until proven otherwise. If wastes temporarily stored at the site are determined to be hazardous, and the origin of the waste is unknown, the operator will immediately contact the Delta City Fire Department and the Millard County Sheriff's Hazardous Materials personnel, which will be responsible for proper management of the wastes. If hazardous wastes are to be transported from the facility, they must be: a) stored at the landfill in accordance with the requirements of a hazardous waste generator; b) manifested; c) transported by a licensed transporter; and d) disposed of at a permitted treatment, storage, or disposal (TSD) facility. UDEQ will be notified of the load waste characterization of any rejected loads. In addition, UDEQ will be contacted to provide guidance on the proper procedures for notifying the waste generator and instructions for proper disposal.

2.4.13 Records of Inspections

A record of each random inspection will be maintained in the facility operating record and made available to UDEQ upon request. The "Record of Random Inspection" form contained in Appendix D will be used to record information obtained during each inspection. Inspection records may include, but are not necessarily limited to, the following items:

- date and time waste loads were received and inspected;
- source or generator of the wastes;
- vehicle and driver identification;
- observations made by the inspector;
- description of rejected loads; and,
- rationale for rejection.

2.4.14 Training of Facility Personnel

Facility personnel are trained in the identification of containers and labels typically used for hazardous and PCB wastes. Training for hazardous material screening procedures address hazardous waste handling, safety precautions, and record keeping requirements. Documentation of personnel training will be included with the operating record of the facility. The training of facility personnel is an ongoing process of on-the-job, in-house, and classroom training.

2.4.15 Handling Procedures for Hazardous or PCB Wastes

If regulated quantities of hazardous or PCB wastes are identified on incoming independent haul vehicles, personnel at the Millard County landfill will refuse to accept the load and UDEQ will be notified. If regulated quantities of hazardous or PCB wastes are identified on incoming County or commercial haul vehicles, or at the working face of a lift, the Delta City Fire Department and the Millard County Sheriff's Office Hazardous Materials personnel will be called. The Millard County Sheriff's Office Hazardous Materials Team will act as the first responder for hazardous materials, and will implement their Hazardous Materials Response Plan. The Fire Department will manage any subsequent activities related to the waste load, including transportation, storage, and containment. Landfill personnel will participate only as directed by the first responders. Following notification, it will be the responsibility of the Millard County Sheriff's Office to ensure that the hazardous materials are handled, stored, or transported in accordance with applicable Federal and State regulation.

According to 40 CFR §262.34, wastes which are determined to be hazardous may be stored at the Millard County landfill for up to 180 days. To satisfy this section of the federal regulation, personnel at the Millard County Landfill or the Delta City Fire Department will perform the following tasks:

- waste will be placed in tanks or 55-gallon containers;
- the containers will be clearly labeled with the date of packaging;
- the containers will be clearly marked with the words "Hazardous Waste"; and,
- the name and telephone number of the emergency response coordinator will be clearly marked on the container.

If waste is transported off-site by a hazardous waste disposal company, a provisional or one-time U.S. Environmental Protection Agency (PA) identification number will be obtained, the

waste will be packaged according to applicable Department of Transportation regulations, and the container will be properly transported and manifested to its point of destination. Proper chain of custody and a manifest document will be obtained from the hazardous materials disposal facility in order to maintain compliance with all applicable federal and state regulations.

In the event that PCB wastes are identified on-site, the Millard County Sheriff's Office or landfill personnel will store and insure disposal of the waste in accordance with 40 CFR Part 761. The following activities will occur:

- an EPA PCB identification number will be obtained;
- the PCB waste will be properly stored until transported;
- the containers will be properly marked with the words, "Caution: Contains PCBs"; and,
- the container will be manifested for shipment to a permitted disposal facility.

2.4.16 Notification

If suspected hazardous materials or PCB wastes are discovered during landfill operations, UDEQ will be notified within 24 hours by personnel at the Millard County Landfill. A record will be submitted to UDEQ, which identifies the date and time of discovery, type of material (if possible without analytical testing), probable hauler, quantity, and actions proposed for the removal of the material from the area of discovery. The record of notification will be entered into the operating record maintained at the facility.

2.5 DAILY AND INTERIM COVER

The soil derived from each trench excavation is stockpiled above the previously completed trench. These stockpiles effectively form an interim cover layer which currently approaches 15 feet thick in places. As previously described, incoming waste is unloaded on the ramp at the southern end of each trench. Near the end of each operating day, the waste is then spread in thin layers, not to exceed two feet in thickness, and compacted using several passes with the Caterpillar 916 compactor. Cover material is then obtained from the soil stockpile and placed over the waste layers to a minimum thickness of six inches.

A portion of each trench remains open during the excavation of the next trench, in order to receive waste during the period of excavation. As the new trench is excavated, soil is stockpiled over the filled portion of the previous trench. When the excavation of the new trench is completed, the remaining portion of the previous trench is covered by a minimum of two feet of native soil. Following the completion of filling of a trench, a minimum of two feet of stockpiled native soil will be left over the previously filled trench. In this way, all trenches will be covered by an interim cover layer immediately following closure. The interim cover will be graded away from the active disposal trench to prevent run-on flow from entering the trench prior

to closure. Berms will be constructed over the interim cover as necessary to control run-on and run-off flows.

2.6 MONITORING AND SELF INSPECTIONS

An Application for a Waiver from Ground Water Monitoring and Liner Requirements at the Millard County Landfill (Vector, 1994) was submitted to the Utah Department of Environmental Quality by Millard County. UDEQ reviewed the waiver application and issued a Request for Additional Information. The additional information was supplied and a letter was issued by UDEQ to Millard County which indicated the granting of such a waiver is probable, pending the approval of the permit application. A copy of each of these documents is included in Appendix E. Based on the technical justification and correspondence contained in the waiver application (Appendix E), the proposed landfill design does not include a leachate collection or ground water monitoring system.

The landfill gas monitoring program for the facility is outlined in Section 7.5 of this application. Millard County will inspect the facility no less than quarterly during the active life to prevent operator errors, discharges which may cause or lead to the release of wastes to the environment or to a threat to human health, and to ensure that proper drainage control measures are in place to prevent run-on from entering the active trench. Inspection will include, at a minimum, detailed observations of the trench walls, the active disposal area, perimeter fencing and drainage systems, and covered fill areas. Millard County will maintain an inspection log which includes, at a minimum, the date and time of the inspection, the printed name and handwritten signature of the inspector, observations made during the inspection, and the date and nature of any repairs or corrective actions performed as a result of the inspection. The inspection logs will be kept for a minimum of three years from the date of the inspection, and will be maintained as part of the operating record within the Plan of Operation. As with the Plan of Operation, the inspection records will be made available to the Executive Secretary upon request.

2.7 RECORD KEEPING

Millard County will maintain and keep, at the County Offices, an operating record for the Millard County Landfill, which will include the following information.

- number of vehicles entering the landfill each day, with estimated types and volumes of waste;
- deviations from the approved plan of operation;
- training and notification procedures;
- results of required gas monitoring;
- inspection logs or summaries;
- incident reports; and
- this application document.

The operating record for the facility will include any information pertaining to the landfill operations, including any additional information required by the Executive Secretary. Examples of forms which will be used at the landfill are included in Appendix D.

2.8 CORRECTIVE ACTION PLAN

Based on the information presented in the Application for a *Waiver from Ground Water Monitoring and Liner Requirements* submitted to the Utah Department of Environmental Quality (UDEQ) and included in Appendix E, it is unlikely that ground water will be impacted by the operation of the Landfill. If ground water is discovered to be affected by landfill operations at some time in the future, an appropriate corrective action plan will be developed and implemented.

2.9 CONTINGENCY PLANS

UAC R315-302-2(d, f, and j) requires the development of contingency plans to be implemented in the event of any emergency at the site. These plans must include an organized, coordinated, and technically and financially feasible course of action for response to fire or explosion, releases of toxic or hazardous material, landfill gas, failure of run-off containment system, and equipment breakdown. In addition, an alternative waste handling or disposal system must be developed in case the facility becomes unable to accept waste because of an emergency. The contingency plan for each of these occurrences is described below.

Note that a general emergency operations plan has been developed for Millard County. In addition, the Millard County Sheriff maintains a hazardous materials response plan. It is anticipated that one of these plans will be invoked by County personnel if the severity of an event at the landfill facility requires the participation of an emergency response team.

2.9.1 Contingency for Fire or Explosion

On-site personnel are prepared to provide immediate fire suppression in the event of an active face or structure fire. Fire extinguishers are mounted on all site equipment and county vehicles. In the event of a fire at the active face or within the waste mass, stockpiled cover soils will be used to cover the burning or smoldering area. Water will not be applied to the active face unless absolutely necessary. In the event of an uncontrolled fire or a fire that cannot be managed by on-site personnel, the Delta City Fire Department will be contacted. The Fire Department is located in downtown Delta, approximately six and three-tenths (6.3) miles from the landfill; estimated response time is 10-15 minutes. Upon arrival at the facility, the Fire Department will assume responsibility for continuing fire abatement activities.

2.9.2 Release of Hazardous or Toxic Materials

In the case of hazardous or toxic material discharges at the Millard County Landfill, the Delta City Fire Department and the Millard County Hazardous Response Team will be notified immediately and will act as the emergency response team. Upon arrival at the Landfill, the Hazardous Materials Response Team will assume responsibility for all subsequent on-site activities related to the containment, handling, and transport off-site of the discharged

material. Hazardous material spills will not be handled by Landfill employees. The operations manager will serve as the Landfill staff liaison with the Emergency Management Response Team, and will ensure the safe evacuation of employees. Advanced planning of emergency exit routes is the responsibility of the Landfill Operations Manager. All employees are regularly apprised of established primary and secondary exit routes.

2.9.3 Landfill Gas

If landfill gas is discovered at the facility at levels above 25% of the lower explosive limit (LEL), operations will immediately be halted and all necessary steps will be taken to insure the protection of human health and the environment. In addition, the Executive Secretary will be notified. Within seven days of the detection of gas levels which exceed the LEL, the detected methane levels and a description of the steps taken to protect human health will be entered into the operating record of the site. Within 60 days of detection, Millard County will develop and implement a remediation plan for the gas release, place a copy of the plan in the operating record, and notify the Executive Secretary that the plan has been implemented. Landfill gas monitoring will be performed on a quarterly basis as described in Section 7.5 of this application.

2.9.4 Failure of Run-off Containment System

Due to the method of disposal utilized at the Millard County landfill, a breach in the integrity of the run-off containment system will not result in the release of contact waters to the areas outside the landfill property. All incoming waste is deposited on a ramp at the southern end of the trench prior to compaction. The ramp slopes to the bottom of the trench. Any breach in the integrity of the run-off containment system at the Landfill will be repaired immediately after run-off flows have receded to an acceptable level.

2.9.5 Equipment Breakdown

Routine equipment maintenance is performed on-site by landfill staff. Equipment repairs are performed on-site by mobile repair units, or the equipment is transported off-site to the repair vendor or to the County Road Shop. Backup equipment can be provided by other Millard County departments within a matter of several hours if necessary. Additionally, auxiliary equipment may be leased from a private contractor as required.

2.9.6 Alternative Waste Handling

In the unlikely event of an emergency which requires the short term closure of the landfill, several options are available. Waste collection may be temporarily discontinued, providing the duration of the crisis is short enough. During such an event, waste which has already been collected will be stockpiled off-site on county owned land. Additional 40-yard roll-off bins may be acquired to accept additional waste volumes at the County's transfer stations. In the event that the landfill is unable to accept waste for an extended period of time, waste may be long-hauled to the Juab County Landfill.

2.10 INSTALLED EQUIPMENT MAINTENANCE

Based on the issuance of a waiver from ground water monitoring and liner requirements, there will not be any leachate collection or treatment equipment installed at the site. Culverts installed beneath site roadways will be inspected during the quarterly site inspection. Clogged culverts will be cleared as soon as possible. Any additional equipment which may be installed at the facility will be inspected in the quarterly monitoring program.

2.11 VECTOR CONTROL

Appropriate vector control procedures are used at the Millard County Landfill for the protection of public health and safety. Compaction and grading of waste at the active face prevents vector harborage in, and access into the waste mass. The subsequent application of six inches of cover soil on a daily basis also deters, reduces, or eliminates entry spaces, food sources, and nesting areas. If necessary, poisons, smoke devices, or sonar techniques may be implemented to control rodent populations.

Insect breeding areas, which may occur in areas of stagnant water, such as in bulky wastes and tires, or in areas of putrescible wastes, will be addressed as discovered. Dead animals will be covered at the end of each day to prevent the attraction of insects. Surface water control measures and liquid waste restriction will minimize the presence of standing water and the accumulation of water in bulky wastes. If insect infestations occur in spite of these measures, approved insecticides will be used.

2.12 TRAINING AND SAFETY PLAN

Current landfill personnel annually attend a landfill operations course presented by the Solid Waste Association of North America (SWANA). The training includes hazardous waste identification and handling, as well as general site operations. All future landfill personnel will be required to attend this, or an equivalent course designed to train landfill operators. Training of landfill personnel is a continuing process which will also include basic first aid, safety training, equipment care, etc. Training will be documented and recorded for each course of instruction, and records will be kept current.

Communication via two-way radios and cell phones in each county vehicle are sufficient to enable contact with outside emergency services to protect the safety of personnel and users of the site. Phones are also available at the landfill shop on-site. Each County vehicle is equipped with a first aid kit. Depending on the severity of the injury, workers may treat themselves, call the Delta City Fire Department, or summon an ambulance. The injured worker is given discretion regarding whom to call and at what point. The operations manager or a County representative will be notified in the case of more severe injuries, and will ensure availability of appropriate medical care. If an emergency response team is called to the site, site personnel will complete a *Millard County Accident / Injury Report* form and record the date, time, type of injury, actions taken, response time of the emergency management service, and the time which the individual was evacuated from the site.

2.13 RECYCLING PROGRAM

Millard County currently does not have a curbside recycling program. As mentioned in Section 2.3, certain household hazardous wastes are currently being recycled by local businesses. Recycling of aluminum and newspaper occurs through voluntary community efforts. Junk automobiles, scrap metal and white goods are stockpiled at the landfill for pickup by a licensed crusher/recycler. Until such time as a regional market for recyclable waste is established, Millard County will promote recycling through public education about product packaging and disposable goods.

2.13 ADDITIONAL OPERATIONAL PROCEDURES

Several additional standards for maintenance and operation are required by UAC (Utah Administrative Code) R315-303-5. Each of these operational standards is briefly discussed below. It is the responsibility of the operations manager to ensure that the facility is in full compliance with the standards of this regulation.

- *Dust Control* - The Landfill access road is paved from U.S. Highway 50 to the vicinity of the current landfill trench. A small segment of gravel road extends from the end of the access road to the active disposal area. The segment of gravel road is currently approximately 600 feet long. The road receives scheduled magnesium chloride treatments from the Millard County Road Department to prevent excessive generation of fugitive dust.
- *Open Burning* - Open burning is prohibited at the Millard County Landfill.
- *Litter Prevention* - a portable chain link fence surrounds the northern, southern, and eastern boundaries of the active trench. The fence serves to collect blown litter and debris. In addition, the landfill and surrounding areas are picked for litter on a regular basis by the Millard County Sheriff's Inmate Work Crew.
- *Scavenging* - Scavenging is prohibited at the Millard County Landfill.
- *Reclamation* - On-site reclamation will be conducted in an orderly, sanitary fashion, and will not interfere with site operations. Reclamation will be an ongoing process at the facility and will include general site grading over old trenches and possible revegetation of cut slopes around the perimeter access road, as needed.
- *Landfill Attendant* - There will be a minimum of one landfill attendant or equipment operator on-site at all time during normal operating hours.
- *Vector Control* - Vector control is described in Section 2.10 above.

- *Reserve Equipment* - The Millard County Landfill is run by Millard County and therefore is able to utilize equipment from other County departments in the event of an equipment breakdown.
- *Boundary Posts* - The entire permitted area is encompassed by a four-strand barbed-wire fence. The entrance to the landfill is clearly marked. The active trench area is bound on three sides by a chain link fence and on the fourth side by a pile of excavated soil which stretches the length of the trench.
- *Compaction and Daily Cover* - Methods for the compaction of waste and the application of daily cover are described in Section 2.4.
- *Monitoring Systems* - Ground water monitoring systems are not included as part of the site design pursuant to the technical justification presented in an application for a waiver from ground water monitoring and liner requirements. This application was previously submitted to the Utah Department of Environmental Quality, and is included as Appendix E of this permit application. The gas monitoring program is defined in Section 7.5 of this report.
- *Recycling* - At this time recycling containers are not planned for the landfill facility. Several containers for common recyclable materials such as aluminum and newspaper are located throughout the City of Delta. At such time that a market develops for additional recyclable materials, containers will be provided within the City of Delta or at the landfill in accordance with UAC R315-303-5(6).
- *Hazardous Waste* - Hazardous waste is prohibited at the Millard County Landfill. The hazardous waste exclusion program for the facility is described in Section 2.3.9 of this application.

3.0 FINANCIAL ASSURANCE PLAN

Millard County, as the owner/operator of this solid waste disposal facility, has developed a Financial Assurance Plan as set forth in UAC R315-15-309. Millard County plans to place a final cover on the landfill twice during the site's estimated sixty-year life. Closure activities will be performed when development of the site reaches the midway point and again when the site reaches full capacity. Although closure and post closure care costs will be paid only near or after the site reaches the midway point and after the date that the landfill stops accepting waste, the county reports a portion of these closure and post closure care costs as an operating expense in each period based on landfill capacity used as of each balance sheet date.

Part of the daily operation of the landfill includes excavation, compaction, and coverage such that, at the close of a given day, part of the cost of covering has already been met with that day's operating expenses. Additionally, the county completes a designated trench prior to moving to the next trench; as one trench is filled and completed it is covered and contoured in such a

manner as to comply with the majority of the final closure requirements. Therefore, much of the cost of closure and post closure will be met in the daily and annual operations of the site.

Costs of closure and post closure for the total county site was estimated by Vector Engineering to be \$483,200.00 in March 1995. The closure post closure costs have been reevaluated as required by this permit by Sunrise Engineering and Geo-Logic Associates as indicated in the equation below. An account has been established with the Utah Public Treasurers' Investment Fund (PTIF), Account # 2436. An annual installment of \$50,000 will be paid to the PTIF fund until the fund balance is sufficient to meet closure and post closure costs by the end of the life of the landfill project.

Actual life of the landfill is estimated at 60+ years if the fill continues at the current rate.

Current Closure Cost Estimate:	\$ 626,833
Current Post-Closure Cost Estimate:	<u>305,088</u>
	\$ 934,921
PTIF Fund Balance Dec 31, 2010	< <u>\$ 576,182</u> >
	\$ 355,740

Closure/Post-Closure will be in place by the end of the permit expiration date.

4.0 CLOSURE PLAN

The Closure Plan has been developed in accordance with the Utah Administrative Code (R315-302-3). Closure of the Millard County landfill will be performed in accordance with this plan and in such a manner as to:

- minimize the need for further maintenance;
- minimize or eliminate threats to human health and the environment from post-closure escape of solid waste constituents, leachate, landfill gases, contaminated run-off or waste decomposition products to the ground, ground water, surface water, or the atmosphere; and,
- adequately prepare the facility for the post-closure period.

This plan and any future alteration or amendments to this plan will be maintained with the operations plan for the facility at the Millard County Offices in Delta, Utah.

4.1 ELEMENTS OF CLOSURE

Millard County will perform final cover placement twice during the predicted 60-year active life of the site. Closure activities will be initiated when the development of the site reaches the location of the middle drainage, illustrated on attached Drawing C-1. As a result, the size of the area to be closed will encompass half of the 80-acre site, or approximately 40 acres. All equipment which will not be used on-site during the post-closure period will be removed. Structures at the site which remain after the final receipt of waste, and which will not be an

integral part of post-closure site maintenance, will be dismantled and removed from the site. Any soil contamination remaining after the final receipt of waste will be removed, treated, or disposed of according to applicable regulations. Following the final receipt of waste, any remaining stockpiles of recyclable or other stored materials will be removed from the site.

Rough contouring will be performed throughout the life of the site during daily operations. Following the general site cleanup described above, final contouring will be performed using native soils to establish a suitable foundation for final cover construction. The site will be surveyed to establish base elevations for closure cap construction. After final grading of the foundation layer, the construction of the final cover layer will begin.

An 18-inch infiltration barrier layer will be installed according to UAC R315-303-4(4)(a), and will have a permeability equal to the permeability of the native soils. Following placement and compaction of the low permeability layer, the landfill will again be surveyed to verify a minimum infiltration barrier layer thickness of 18 inches, and final slope grades of at least two percent. The hydraulic conductivity of the low permeability layer will be field-tested and certified to be within acceptable limits. The testing will be performed as part of a Construction Quality Assurance (CQA) closure certification program. Material laboratory test work will be used to establish the field test criteria. The Closure Certification Report will include the material characteristics for the soil used as the low permeability layer, as well as the procedures and results of the field methods used during the CQA Program. Preliminary field observations and laboratory analyses presented in the Vector (1994, appendix E) indicate that a sufficient volume of low permeability material exists on-site to construct the infiltration barrier layer.

Following the construction and certification of an approved infiltration barrier layer, a minimum of six inches of native soil will be placed over the infiltration barrier layer in accordance with UAC R315-303-4(4)(b). This six-inch layer will be capable of sustaining native plant growth and preventing excessive amounts of erosion. The layer will be seeded or hydro seeded with a seed mixture designed or recommended by a representative of the United States Department of Agriculture Soil Conservation Service.

Interior and exterior perimeter drainages or drainage diversions will be constructed as defined in Section 4.2 and illustrated on Drawing C-1 (Appendix I). The drainages will assist in maintaining the integrity of the final cover and preventing a washout of waste due to uncontrolled run-off during precipitation events. A final cover constructed in accordance with the design standards set forth in UAC R315-303-4, presented in Section 4.2 and illustrated in Drawing C-2 (Appendix I), will be sufficient to prevent the infiltration of surface waters through the underlying waste mass.

4.2 CLOSURE DESIGN

The final cover will be constructed in accordance with UAC R315-303-4(4)(a). The final cover will consist of an 18-inch low permeability infiltration layer and a six-inch erosion layer. The infiltration layer will have permeability equal to the permeability of the natural

subsurface soils beneath the landfill. The six-inch erosion layer will consist of on-site soils capable of sustaining native plant growth. The final cover layer will be revegetated with native grasses according to a plan developed or recommended by a representative of the U.S.D.A. Soil Conservation Service. The final cover will be graded so as to prevent ponding and minimize infiltration of run-off waters.

The closure design is illustrated on Drawings C-1, C-2 and C-3 (Appendix I). The entire 80-acre site is included in the closure design. As described above, the largest area to be covered at any time will be approximately 40 acres, or half of the site. Due to the relatively flat topography surrounding the facility, the final topography of the closed landfill was designed to minimize the vertical rise of the closure surface while maintaining a minimum grade of two percent on all slopes. As illustrated on Drawing C-1 (Appendix I), the design consists of three parallel ridges trending east-west across the site. The ridge side slopes will be graded at a minimum of two percent into two internal drainage swales and a perimeter drainage channel.

The average annual rainfall in Millard County, specifically the Delta area, is 8.11 inches. Drainage channels were sized to accommodate the flow from a 25-year, 24-hour storm event. A detailed discussion of site hydrology and hydraulics is included in Section 7.0 of this application, and the drainage report presented in Appendix H. The internal drainage swales and interior perimeter channel will grade at approximately one percent downhill and to the west. The two internal drainage swales are intercepted halfway across the site by the middle drainage, which will direct run-off water from the final closed surface south down the middle and off-site. A detail and schematic cross sections of the middle drainage channel are included on Drawing D-1 (Appendix I). A drainage channel will be constructed around the interior perimeter of the closed area, inside the perimeter access road. Three culverts will be installed in strategic locations to direct run-off from the closed surface of the landfill away from the site. A 24-inch corrugated metal pipe culvert (culvert #3) will route flow from the middle drainage channel under the perimeter access road and off-site to the south. Two additional culverts (culverts #1 and #2) will direct run-off from the western half of the site under the perimeter access road and into natural drainages off-site.

An exterior perimeter drainage channel, outside the perimeter access road, will be constructed along the northern and eastern site boundary. This will intercept any potential run-on flow and redirect it around the closure cap and off the site. As illustrated on Drawing C-1 (Appendix I), run-on flow will be redirected from the site into adjacent natural drainages. The exterior perimeter drainage will be constructed coincident with the phased construction of the trenches throughout the life of the facility.

4.3 SITE CAPACITY

The Millard County Landfill utilizes excavated trenches for waste disposal. The trenches are excavated parallel to each other, and are aligned in a north-south direction. Each trench is approximately 1,000 feet long, 60 feet wide and 25 feet deep. The trenches typically can be utilized for approximately three years. Current operating plans are to excavate the trenches successively from east to west across the property. Millard County is currently filling the eighth

trench to be excavated since the opening of the landfill in 1989. The existing trenches are separated by approximately ten feet of native soil. In order to estimate the expected active life of the site, the following assumptions are made:

- each trench is 1,000 feet long, 60 feet wide and 25 feet deep;
- uncompacted waste density is 300 lbs. /yd³;
- waste is compacted to 1,000 lbs. /yd³;
- waste to soil ratio is 4:1;
- soil is compacted 10%; and,
- trenches are separated by approximately 10 feet of native soil.

Loading rate calculations based on these assumptions are included in appendix F. Twenty-year growth projections for the county were obtained from the Millard County solid Waste management Plan (Stansbury, 1993). Approximately eight trenches will be excavated through the 2012. Assuming a conservative final trench width of 80 feet, separated by 30 feet of native soil, 22 additional trenches can be excavated between the existing trench and the western site boundary. Based on the current trench size and capacity, the remaining undisturbed portion of the site will hold a total disposal volume of waste and cover soil of approximately 1,222,210 cubic yards. A graph of the cumulative disposal volume over time is also presented in appendix F. Using the slope of the curve, representing the projected growth in waste disposal volume for the years 1992 to 2012, to project the growth of the waste stream farther into the future, it will take approximately 44 years to reach a remaining site capacity of 1,222,210 cubic yards. The remaining capacity of the site (1,222,210 cubic yards) includes 977,768 yd³ of waste and 244,442 yd³ of soil. This volume of waste, compacted at 1,000 lbs. /yd³, is equivalent 488,884 tons of waste. Based on this data, it is reasonable to predict a conservative site life of 60 years.

*Note - Based on the data in the application, with trenches being separated by 10 feet of native soil (rather than the original design of 30 feet between trenches), it is currently reasonable to predict a conservative site life of 100 years or more.

4.4 CLOSURE SCHEDULE


At least 60 days before the projected final receipt of waste, Millard County will notify the Executive Secretary of the intent to close the landfill and implement the closure plan. Within thirty (30) days after the final receipt of waste, Millard County will initiate implementation of the closure plan. The closure activities described in this plan will be completed within 180 days of initiation. Following the completion of closure activities, Millard County will submit to the Executive Secretary a set of as-built drawings of final closure construction signed by a professional engineer registered in the State of Utah. Millard County will also provide certification of the compliance of final closure construction with the approved closure plan. The certification will be signed by a representative of Millard County and a professional engineer registered in the State of Utah.

4.5 CLOSURE COSTS

The closure cost estimate, detailed in Table 4.1 below, has been prepared utilizing Appendix G of the Solid Waste Permitting and Management Rules as a general guideline. According to the proposed Closure Plan, the largest area requiring closure at any time will be approximately 40 acres.

TABLE 4.1
H-1 Basis of Quantities
Millard County Landfill

*The original table listed well installation at a cost of \$10,000. The well was installed in 2001

SUNRISE ENGINEERING, INC. CONSULTING ENGINEERS AND SURVEYORS <i>H.1- Basis of Quantities</i>		 SUNRISE ENGINEERING	
Project: MILLARD COUNTY LANDFILL		Date:	14-Sep-11
		By:	SCD
		Reviewed By:	ZWP
Based on Oklahoma Department of Environmental Quality 2010 Worksheet for Calculating Closure and Post-closure Cost Estimates table H.1 as Provided in the Utah Division of Solid and Hazardous Waste Solid Waste Management Program, Preparation of Solid Waste Facility Closure and Post Closure Cost Estimates Guidance.			
Description		Quantity	Units
Total Permitted Area		80	acres
Active Portion			
	Composite Lined	0	acres
	Soil Lined	58	acres
Area of Largest Cell/Phase Requiring Final Cap			
	Composite Lined	0	acres
	Soil Lined	40	acres
Perimeter Fencing		7200	linear feet
Groundwater Monitoring Wells		0	VLF
Methane Gas Probes		0	VLF
Terraces		0	linear feet
Letdown Channels		0	linear feet
Perimeter Drainage Ditches		7200	linear feet
Average Daily Flow		41	ton/day
Landfill Disposal Cost		16.5	\$/ton

SUNRISE ENGINEERING, INC.

CONSULTING ENGINEERS AND SURVEYORS

H.2 - Landfill Closure Opinion of Probable Costs

Table 4.1.2 Landfill
Closure Opinion of Probable Costs



Project: MILLARD COUNTY LANDFILL

Date: 14-Sep-11

By: SCD

Reviewed By: ZWP

MILLARD COUNTY LANDFILL CLOSURE COST ESTIMATE

Based on Oklahoma Department of Environmental Quality 2010 Worksheet for Calculating Closure and Post-closure Cost Estimates table H.2 as Provided in the Utah Division of Solid and Hazardous Waste Solid Waste Management Program,

Preparation of Solid Waste Facility Closure and Post Closure Cost Estimates Guidance.

	Task/Service	Quantity	Units	Multiplier ^a	Unit Cost ^b	Subtotal	SOURCE	NOTES
1.0	PRELIMINARY SITE WORK							
a	Conduct Site Evaluation	1	Lump sum	1	\$ 3,224.41	\$ 3,224	a.	
b	Disposal of Final Wastes							
	Average Daily Flow	41	tons/day		\$ -	\$ -		
	Disposal Cost	41	tons/day	5	\$ 16.50	\$ 3,383		
c	Remove Temporary Buildings	1	Lump sum	1	\$ 2,956.80	\$ 2,957	a.	
d	Remove Equipment	1	Lump sum	1	\$ 2,413.62	\$ 2,414	a.	
e	Repair/Replace Perimeter Fencing	7,200	linear feet	0.25	\$ 3.16	\$ 5,688	a.	
f	Clean Leachate Lines	N/A	Lump sum	1	\$ 1,460.44	\$ -	a.	
2.0	Monitoring Equipment							
a	Rework/Replace Monitoring Well(s)	N/A	VLF	0.25	\$ 67.81	\$ -		no monitoring equipment is installed
b	Plug Abandoned Monitoring Well(s)	N/A	VLF	0.25	\$ 27.14	\$ -		per the original permit application,
c	Rework/Replace Methane Probe(s)	N/A	VLF	0.25	\$ 58.55	\$ -		gas is monitored using a handheld
d	Plug Abandoned Methane Probe(s)	N/A	VLF	0.25	\$ 21.40	\$ -		monitor, and to date no significant
e	Rework/Replace Remediation and/or Gas Control Equipment	N/A	Lump sum	0.05	\$ -	\$ -	a.	amount of gas has been detected
3.0	CONSTRUCTION							
a	Complete Site Grading to Include On- and Off- Site Borrow Areas	30	acres	1	\$ 1,278.00	\$ 38,340	a.	
b	Construct Final Cap							
	Compacted On-Site Clay Cap or	2,600	cubic yards	1	4.60	\$ 333,960	a.	
	Compacted Off-Site Clay Cap or	N/A	cubic yards	1	7.45	\$ -		On-site material is used
	Install Geosynthetic Clay Liner Cap	N/A	square feet	1	0.47	\$ -		On-site material is used
c	Contract Landfill Gas Venting Layer	N/A						not included in landfill
	Place Sand or	N/A	acres	1	34,183.10	\$ -		not included in landfill
	Install Net and Geotextile	N/A	square feet	1	0.33	\$ -		not included in landfill
d	Install Passive Landfill Gas Vents	N/A	acres	1	818.98	\$ -		not included in landfill
e	Install Flexible Membrane Line	N/A	square feet	1	0.36	\$ -		not included in landfill
f	Drainage Layer	N/A						not included due to exemption
	Place Sand or	N/A	acres	1	34,183.10	\$ -		
	Install Net and Geonet	N/A	square feet	1	0.33	\$ -		
g	Place On-site Topsoil	24,200	cubic yards	1	1.97	\$ 47,674	a.	based on 6" layer over 40 acres
	Place Off-site Topsoil	N/A	cubic yards	1	15.78	\$ -		
h	Establish vegetative cover, including on- and off-site borrow areas	30	acres	1	485.15	\$ 14,555	a.	
4	Drainage/erosion control							
a	Construct Terraces	N/A	linear feet	1	8.26	\$ -		
b	Construct Letdown Channels	N/A	linear feet	1	7.77	\$ -		
c	Clean Perimeter Drainage Ditches	7,200	linear feet	0.5	6.30	\$ 22,680	a.	
5	Tasks Not Identified	N/A						
6	Subtotal					\$ 474,874		
7	Administrative Services	1	Lump sum	0.10	474,873.83	\$ 47,487	a.	
8	Technical and Professional Services	1	Lump sum	0.12	474,873.83	\$ 56,985	a.	
9	Closure Contingency	1	Lump sum	0.10	474,873.83	\$ 47,487	a.	
10	Total Final Closure					\$ 626,833		

a. Oklahoma Department of Environmental Quality as Provided in the Utah Division of Solid and Hazardous Waste Solid Waste Management Program, Preparation of Solid Waste Facility Closure and Post Closure Cost Estimates Guidance.

b. In providing opinions of probable construction cost, the Client understands that the Engineer has no control over costs or the price of labor, equipment or materials, or over the Contractor's method of pricing, and that the opinion of probable construction cost provided herein is made on the basis of the Engineer's qualifications and experience. The Engineer makes no warranty, expressed or implied, as to the accuracy of such opinions compared to bid or actual costs.

4.6 FINAL INSPECTION

Following the completion of closure activities, a final report will be prepared and certified by an engineer registered in the State of Utah. The report will present laboratory and field test data which support the conformance of the final cover installation and closure activities with the Utah Solid Waste regulations and the approved Closure Plan. The report will also include facility closure plan sheets signed by a professional engineer registered in the State of Utah which represent the final, as-built closure construction. The Executive Secretary will be notified of the completion of closure activities and arrangements will be made for a final inspection by UDEQ. Following final approval by UDEQ, the post-closure maintenance plan will be initiated pursuant to the approved Post-Closure Plan, outlined in Section 5.0 of this permit application.

5.0 POST-CLOSURE PLAN

The Post-Closure Plan has been developed in accordance with UAC R315-302-3. Post-closure care and maintenance of the Millard county Landfill will be performed in accordance with this plan, which provides for continued facility maintenance and landfill gas monitoring. The design of the Millard County landfill does not include a ground water monitoring or leachate collection system, and surface water is not present within two miles of the site. Therefore, the post-closure plan does not include ground or surface water monitoring. The office listed below may be contacted during the post-closure period regarding issued which concern the landfill property:

Millard County Offices
71 South 200 West, PO Box 854
Delta, UT 84624
(435) 864-1400

5.1 MONITORING

This permit application is submitted without provision for ground water monitoring, surface water monitoring, or leachate collection or treatment systems. Exclusion of these items is based on the technical justification documented in Appendix E (Vector, 1994).

Landfill gas monitoring will be continued on a quarterly basis during the post-closure period at all monitoring points established throughout the life of the facility. If the results of continued monitoring at the facility indicate that the site has stabilized and does not pose a threat to human health or the environment, the owner or operator may petition the Executive Secretary for a decrease in the length of the post-closure monitoring period.

5.2 MONITORING SYSTEM MAINTENANCE

Following closure of the Millard County landfill, the final cover and drainage systems will be inspected at least annually by personnel from Millard County. The final cover and drainage system will be examined for the effects of erosion, subsidence, settlement, or other events which may compromise the integrity of the final cover or the effectiveness of the drainage system. Necessary repairs will be completed as soon as is practicable following each inspection in order to maintain the effectiveness of the drainage system and restore the integrity of the final cover. The site perimeter fence will also be inspected during annual inspection.

5.3 POST-CLOSURE SCHEDULE

Post-closure activities will be initiated immediately following the completion of the closure activities described in Section 4.0 of this application. Post-closure activities will continue for a period of thirty years or a period established by the Executive Secretary. If post-closure monitoring activities indicate that the site has stabilized and does not pose a threat to human health or the environment, Millard County will petition the Executive Secretary for a decrease in the length of the post-closure monitoring period.

Upon completion of post-closure monitoring activities as determined by the Executive Secretary, Millard County will submit to the Executive Secretary a certification, signed by the county and a professional engineer registered in the State of Utah, which states why post-closure activities are no longer necessary. Following final approval by the Executive Secretary, post-closure monitoring activities will be discontinued.

5.4 RECORD MODIFICATIONS

Within 60 days after the completion of all closure activities, plats and a statement of fact concerning the location of any disposal site shall be recorded as part of the record of title with the Millard County Recorder. The notation will serve to notify any potential purchaser of the property that the land has been used as a landfill, and that its use may be restricted by local land use or zoning regulations. Millard County will notify the Executive Secretary that the deed notation has been recorded.

5.5 POST-CLOSURE COSTS

The following post-closure cost estimate has been prepared utilizing Appendix G of the Utah State Solid Waste Permitting and management Rules. Some of the assumptions used to derive the cost estimate included annual inspections of the integrity of the final cover and general site condition, and semiannual monitoring for landfill gas. In addition, the cost estimate was calculated assuming a third-party would perform the inspections and monitoring. The cost estimate for annual post-closure care is presented in detail in Table 5.1 below, and is based on 1995 dollars. A ten percent contingency has been built into the cost estimate. Projected fund

withdrawals to support post-closure activities will be discussed in the financial assurance document.

TABLE 5.1
COST ESTIMATE FOR ANNUAL POST-CLOSURE CARE
Millard County Landfill

NOTE: Based on annual site inspections and quarterly gas monitoring.

MILLARD COUNTY LANDFILL POST-CLOSURE MAINTENANCE COSTS							
	ITEM	QNTY	UNIT	UNIT COST	Annual Cost	30-YEAR COSTS	
1	Site Maintenance						
a.	Site Inspections	1	each	\$ 586.56	\$ 587.00	\$	17,597.00
b.	General Maintenance	1	each	\$ 1,758.53	\$ 1,759.00	\$	2,756.00
	Subtotal - Site Maintenance				\$ 2,346.00	\$	70,353.00
2	Monitoring						
a.	Landfill Gas Monitoring	2	each	\$ 1,000.00	\$ 2,000.00	\$	60,000.00
	Subtotal, Monitoring						
4	Final Cover Maintenance						
a.	Repair Erosion, Settlement and Subsidence	1,000	sf	\$ 2.20	\$ 2,200.00	\$	66,000.00
b.	Reseed Vegetative cover	1,000	sf	\$ 0.20	\$ 200.00	\$	6,000.00
	Subtotal, Final cover Maintenance				\$ 2,400.00	\$	72,000.00
8	Administrative Services	1	ls	\$ 1,000.00	\$ 1,000.00	\$	30,000.00
9	Technical and Professional Services	1	ls	\$ 1,500.00	\$ 1,500.00	\$	45,000.00
	Subtotal , Administrative, Technical, & Professional Services						
	Subtotal, Post-Closure Maintenance Costs				\$ 9,246.00	\$	277,353.00
10	Contingencies	10%			\$ 925.00	\$	27,735.00
	TOTAL				\$ 10,171.00	\$	305,088.00

PART III - TECHNICAL DATA

6.0 GEOHYDROLOGICAL ASSESSMENT

The majority of the requirements of UAC R315-310-4(2) (b) are addressed in the document *Application for a Waiver from Ground Water Monitoring and Liner Requirements at the Millard County Landfill* (Vector, 1994), submitted to the Utah Department of Environmental Quality in November of 1994, the subsequent *Request for Addition Information* from UDEQ, and the *Response to Request for Additional Information* submitted to UDEQ by Millard County. The waiver application and related correspondence with the Utah Department of Environmental Quality are included in Appendix E, and are considered integral parts of this permit application. The waiver application (Vector, 1994) addresses the following elements of a geohydrological assessment, as defined by UAC R315-310-4(2) (b):

- local and regional geology and hydrology;
- evaluation of soil types and properties, including permeability rates;
- depths to ground water or aquifers;
- direction of ground water flow; and,
- calculation of site water balance using HELP model.

The reader is referred to the document (Appendix E) for detailed discussions of these elements of the Geohydrological Assessment. The remaining requirements of a geohydrological assessment, address below, include the following:

- faults, unstable slopes, and subsidence areas on-site;
- quantity, location, and construction of any private and public wells on the site and within a 2,000 foot radius of the site;
- tabulation of all water rights for ground and surface water on the site and within a 2,000 foot radius of the site;
- identification and description of all surface waters on the site and within a one-mile radius of the site;
- background ground and surface water quality assessment; and,
- conceptual design of ground and surface water monitoring systems.

6.1 Faults, Unstable Slopes, and Subsidence Areas

Geologic coverage of the landfill area is provided at a scale of 1:250,000 by Hintze (1963). As abstracted from Hintze's (1963) map, the landfill area is dominated by Quaternary alluvial and eolian sediments. Hintze (1963) did not identify any faults in the area surrounding the landfill. In addition, the U.S. Geological Survey map MF-916 (*Preliminary Map of Young Faults in the United States as a Guide to Possible Fault Activity*) does not indicate the present of Holocene faulting in the vicinity of the Millard county Landfill. A study by Christenson and Nava (1992) indicates that the nearest fault with evidence of movement in Holocene time is more than 10 miles west of the landfill. An additional study by Anderson and Miller (1979) places the nearest Quaternary fault over six miles south of the landfill. Additional faults were not identified in the landfill area.

Soils beneath the landfill property are characterized by dense silts and stiff to very stiff clays. No expansive soils are known to exist anywhere on the property. No subsidence has been observed in the areas of the two completed landfill trenches, either by soil settlement due to the overlying waste load, or due to settlement within the waste mass itself.

A study by Mulvey (1992) *entitled Engineering Geologic Problems Caused by Soil and Rock in Southwestern Utah* provides a generalized map of the distribution of problem soil and rock in southwestern Utah. The study defines six types of problem soil or rock found in southwestern Utah: expansive soil or rock; collapsible soil; gypsiferous soil or rock; limestone (karst); soils susceptible to piping; and, areas which contain active dunes. None of these soil or rock types are identified by Mulvey (1992) in the area of the Millard County Landfill. There are no steep slopes or bedrock outcrops in the vicinity of the landfill. The nearest lithologic unit which has been characterized as unstable slope having the potential for mass-wasting lies approximately 40 miles south of the site (Harty, 1992). A map of landslides in southwestern Utah by Harty (1992) shows the nearest landslide to be more than 10 miles northeast of the landfill.

6.2 Wells, Water Rights, and Surface Water

File searches by the State of Utah Division of Water Rights did not disclose the presence of any water rights or existing or abandoned wells within a 2,000 foot radius of the landfill site. A copy of the correspondence from the Division of Water Rights is included as Appendix G of this permit application.

Surface water is not present within a one-mile radius of the site; however, several small, ephemeral drainages are located within one mile of the landfill. These drainages, by definition, carry water only during periods of heavy precipitation, and then only for short durations. All potential surface water in the form of run-off, whether confined to ephemeral drainages or occurring as sheet flow, will be redirected around the landfill property as described in Section 7.6 of this report. Any waters which are redirected around the site will not come into contact with any possible contaminants resulting from the operation of the landfill. Therefore, no surface water is threatened by the location of the Millard County Landfill.

6.3 Ground and Surface Water Quality

Surface water is not present within the vicinity of the landfill property. There are two wells within two miles of the landfill which have recorded chemical data for ground water. At the time of the original application in 1995, the closest well, identified as 26daa-3 by Enright and Holmes (1982), was located approximately one mile southwest of the landfill. An additional well for which published data exists is located up-gradient from and approximately two miles directly north of the landfill. This well was identified by Mower and Feltis (1964) as 12dad-1. Chemical data for the northern well (12dad-1) collared at an elevation 4,626 feet (MSL) and completed to a depth of 720 feet, are available from analyses performed in 1962. Chemical data for the closer well southwest of the landfill (26daa-3), collared at the elevation of 4,634 feet (MSL), are available from the 1978 (Enright and Holmes, 1982). The depth of well 12dad-1 is

unknown. The chemical data for each of these wells are summarized in Table 6.1, and are derived from published data by Enright and Hohnes (1982), and Mower and Feltis (1964). There are now two industrial dairies within one mile of the landfill which were not there at the time of the original landfill permit application.

6.4 Ground and Surface Water Monitoring Systems

The requirements of a geohydrological assessment, as defined by UAC R315-310-4(2)(b), call for a conceptual design of ground and surface water monitoring systems, including proposed installation methods and a vadose zone monitoring plan, where required. This permit application is submitted without provisions for a liner, ground water, surface water, or vadose zone monitoring system. The exclusion of these provisions is supported by the technical justification previous submitted to UDEQ in Vector (1994). The waiver application and related correspondence from UDEQ are included in Appendix E of this application.

Table 6.1 - Ground Water Chemistry

Well Location	(C-17-6) 12dad-1*	(C-17-6) 26daa-3**
Sample Date	11/27/62	06/26/78
Temperature	-	21
Sp.Conductance (µmhos)	1090	630
pH	7.3	7.6
Hardness (mg/L as CaCO ₃)	316	140
Hardness - Noncarbonate (mg/L as aCO ₃)	41	0
CALCIUM -dissolved (mg/L as Ca)	34	27
MAGNESIUM - dissolved (mg/L as Mg)	56	18
SODIUM - dissolved (mg/L as Na)	-	73
POTASSIUM - dissolved (mg/L as K)	-	18
Na + K - dissolved (mg/L as Na)	108	-
BORON - dissolved (µ/L as B)	-	290
MANGANESE - dissolved (µg/L as Mn)-		<10
ALKALINITY FIELD (mg/L as CaCO ₃)	-	220
SULFATE - dissolved (mg/L as SO ₄)	51	40
CHLORIDE - dissolved (mg/L as Cl)	151	41
FLUORIDE - dissolved (mg/L as F)	-	1.6
SILICA - dissolved (mg/L as SiO ₂)	56	59
SOLIDS - Sum of constituents - dissolved (mg/L)	634	413
NITROGEN, NO ₂ +nO ₃ - dissolved (mg/L)	-	0.34
ARSENIC - dissolved (µg/L as As)	-	-

* ground water chemistry data from mower and Feltis (1964)

** ground water chemistry data from Enright & Holmes (1982)

7.0 ENGINEERING REPORT

This engineering report has been prepared in accordance with R315-310-4(2) (c) of the Utah Administrative Code (UAC).

7.1 Maps, Drawings, and Specifications

All maps and drawings are included in Appendix I of this permit application. Drawing a-1 is a title sheet and vicinity map for the Millard County Landfill. Drawing B-1 is an original copy of the United States Geological Survey Harding, Utah 7.5 Minute topographic quadrangle map. The map has been modified to show the property and facility boundary, the zoning and land use designation of the surrounding area, the latitude and longitude of the facility entrance, and the direction of the prevailing winds. At the time of the original application, there were no existing utilities or structures within one quarter mile of the site, with the exception of the maintenance/storage shed located on-site and illustrated in Drawing B-2. There is now a three-bay shop/office landfill building, along with a well and pump house, near the entrance of the facility which is owned by Millard County. There are also two industrial dairies located within ½ mile of the landfill site.

- Drawing B-2* illustrates the existing topography of the site and the existing and proposed facilities. The topographic base map was generated from a ground survey performed by Sunrise Engineering, Inc. for Millard County.

- Drawing B-3* shows the location of structure and well built in 2001.

- Drawing C-1* presents the conceptual closure design for the Millard County Landfill

- Drawings C-2 and C-3* illustrate several cross sections of the conceptual closure surface. The location of each cross section is indicated on Drawing C-1.

- Drawing D-1* presents specific details of existing and proposed facilities.

It should be noted that the topography and design of the trench presented in Drawings B-2, C-1, and detail C on Drawing D-1 are shown as-built as part of the current operations conducted by Millard County. A slope stability analysis was not performed as part of the site design presented in these drawings.

7.2 Location Standards

UAC R315-302-1 mandates that all applicable solid waste facilities are subject to certain restrictions regarding the location of the facility. The Millard County Landfill is an existing facility, and is therefore not subject to most of the location restrictions defined in UAC R315-302-1. UAC R315-302-1(3) mandates that existing facilities must meet the location restrictions pertaining to airports, flood plains, and unstable

areas, or must close by October 9, 1996. The compatibility of the existing site with respect to these restrictions is discussed below.

7.2.1 Airports

The Millard County Landfill is not located within ten thousand feet of an airport runway end. The nearest airport is located more than three miles northwest of the landfill near Delta City, Utah.

7.2.2 Floodplains

A review of the U.S. Department of Housing and Urban Development FEMA Community Panel Maps for Millard County unincorporated areas (FEMA, 1987) indicates that the flood hazard of the Landfill area has not been determined. As a result, an investigation of site geology, geomorphology and topography was undertaken in accordance with recommendations contained in the U.S. Environmental Protection Agency publication entitled *Draft Technical Manual for Solid Waste Disposal Facility Criteria - 40 CFR part 258* (U.S. EPA, 1992). According to UAC R315-301-1(23), "floodplain" means "the land which has been or may be hereafter covered by floodwater which has a 1% chance of occurring in any given year. The flood is also referred to as the base flood, or 100-yr flood." Review of the U.S. Geological Survey topographic map (Drawing B-1, Appendix I) of the area indicates an absence of surface water, streams, springs, or seeps within a 3000-foot radius of the landfill site. There are no large washes or drainages which either intersect or lie uphill of the landfill property. The U.S. EPA's *Draft Technical Manual* (U.S. EPA, 1992) identifies floodplains as flat areas adjacent to a river's normal channel, represented by sedimentary deposits formed by floods that have a one percent chance of occurrence in a 100-year period. The area surrounding the Millard County Landfill does not meet the definition of a floodplain as described in UAC R315-301-1-(23) and the E.P.A. *Draft Technical Manual* (U.S. EPA, 1992).

7.2.3 Unstable Areas

UAC R315-302-1(2)(b)(iii) requires that the owner or operator of an existing facility, a lateral expansion of an existing facility, or a new facility must demonstrate that engineering measures have been incorporated into the design of the facility to ensure that the integrity of the structural components of the facility will be disrupted. This demonstration must consider the following:

- on-site or local soil conditions that may result in significant differential settling;
- on-site or local geologic or geomorphologic features; and,
- on-site or local human-made features or events, both surface and subsurface.

A field investigation was undertaken in the development of the waiver application (Vector, 1994, Appendix E) and included a subsurface drilling and sampling program. Information obtained during the investigation indicates that the soils beneath the landfill property are characterized by dense silts and stiff to very stiff clays. No expansive soils are known to exist anywhere on the property. Subsidence has not been observed in the areas of the two completed landfill trenches, either by soil settlement due to the overlying waste load, or due to settlement within the waste mass itself

As discussed in Section 6.1, a study by Mulvey (1992) indicates that there is no problem soil or rock in the vicinity of the landfill. There are no dammed bodies of water up-gradient from the landfill. There are no underground mines in the vicinity. In addition, on-site subsurface exploration and a review of available geologic literature did not reveal the presence of salt domes or beds in the area of the landfill. There are no slopes or bedrock outcroppings in the vicinity of the landfill. The nearest lithologic unit which has been characterized as having the potential for mass-wasting lies approximately 40 miles south of the site (Harty, 1992). A map of landslides in southwestern Utah (Harty, 1992) shows that the nearest landslide is greater than 10 miles northeast of the landfill. Based on this information, the Millard County landfill satisfies the location restrictions defined in UAC R315-302-1(3).

7.3 DESIGN AND OPERATION

As illustrated in Drawing B-2 (Appendix I), the Millard County Landfill consists of a series of trenches aligned in a north-south direction and progressing from east to west across the property. Each trench is approximately 1,000 feet long, 25 feet deep and 60 feet wide. Total volumetric capacity of each trench is approximately 55,500 cubic yards. The current trench configuration was developed by Millard County and is depicted "as-built" in all drawings. The sidewall slope angles of the trenches are approximately 75 to 80 degrees from horizontal. A ramp is provided at the active end and center of each trench for access by landfill equipment.

Daily operations begin with the receipt of incoming waste at the southern end of the active trench. Near the end of the operating day, the waste is spread and compacted in thin layers less than two feet in thickness. Daily cover material is subsequently retrieved from nearby stockpiles and spread over the waste layers to a minimum, thickness of six inches.

As mentioned in the Plan of Operation, a daily cover material is derived from soil stockpiles generated during trench excavation. As each trench is excavated, soil is stockpiled over the previously completed trench, reaching thicknesses of up to 15 feet in places. As the operation of the new trench processes, cover soil is obtained from these stockpiles for use as daily cover. The thickness of cover over each previous trench is maintained at a minimum of two feet, and will act as an interim cover during the active life of the facility. In addition, the raised surface of the interim cover over the relatively flat topography of the area will redirect any potential run-on flow around and away from the active trench area. Contouring of the inactive portions of the landfill will be a continuing process throughout the life of the facility in preparation for the placement of the final cover. Re-contoured areas of the landfill will be periodically revegetated during the life of the facility in order to reduce the volume and velocity of run-off flows. These activities are further discussed in Section 7.6 below. A final revegetation plan will be executed following the installation of a final cover at the end of the active life.

7.4 GROUND WATER MONITORING, LEACHATE COLLECTION, AND LEACHATE TREATMENT SYSTEMS

Based on the *Application for a Waiver from Ground Water Monitoring and Liner Requirements at the Millard County Landfill* (Vector, 1994), submitted to the Utah Department of Environmental Quality on November 4, 1994 and included with the original application as Appendix E, this permit application is submitted for approval of continued operations without ground water monitoring, leachate collection, or leachate treatment system.

7.5 LANDFILL GAS CONTROL AND MONITORING

Landfill gas monitoring is performed at the site on a quarterly basis and will continue during the active life of the facility. Because of the relatively low permeability and transmissivity of the soils which underlie the site, gas monitoring wells are not proposed. Instead, specified locations around the site are analyzed utilizing a hand-held detector which is capable of detecting the concentration of landfill gas in the air. The instrument is capable of determining if landfill gas has exceeded 25% of its lower explosive limit at each measuring point. If landfill gas analysis detects a concentration in excess of 25% of the lower explosive limit (LEL), the contingency plan described in 2.8.3 will be initiated. Initial gas monitoring locations are illustrated on Drawing B-2 (Appendix I) and include monitoring points around the site perimeter, near the active face, around old fill areas, and inside the on-site maintenance/storage building. Additional monitoring points will be added as the facility expands. To date no detectable amounts of gas have been detected.

7.6 RUN-ON/RUN-OFF CONTROL SYSTEMS

Run-on controls during the active life of the facility will include the gradual construction of exterior perimeter drainages along the eastern and north property boundaries. The drainages will be approximately 18 inches deep, with 2:1 side slopes, and will direct potential run-on flows around the property boundary. A V-ditch of this size, over the relatively flat grades in the vicinity of the landfill, is capable of transporting more than 18 cubic feet of water per second, sufficient to accommodate expected run-on flows. As discussed in Section 7.3 above, excess excavated native soil will act as an interim cover over inactive portions of the landfill. The added thickness of the interim cover, maintained at a minimum thickness of two feet over the relatively flat local topography, will act as a diversion berm for potential run-on flows because the filled and covered portions of the landfill will always be located up-slope from the active trench. An additional temporary diversion berm will be constructed on the up-slope side of each active trench. This will redirect potential run-on flows that are generated within the site boundaries, up-slope from the active trench. As a result of the combination of these run-on control features, the amount of water entering the active trench will be restricted to direct precipitation.

Run-off control systems are not proposed for the facility during the active life of the site. All precipitation or surface water which comes into contact with waste will be contained within the active disposal trench. Run-off generated within the property boundary and east of the active

trench will be directed around the active trench by the temporary diversion berm described above.

The run-off control systems proposed for the Millard County Landfill for the post-closure period, illustrated on Drawing C-1 (Appendix I), have been designed to control and redirect the flow resulting from a 25-year, 24-hour storm event. A drainage report has been prepared for the landfill site and addresses drainage conditions under existing and closed surface conditions. The drainage report is included with this application as Appendix H. Although shown on Drawing B-2 as part of the facility's run-on/run-off control system, the interior perimeter drainage will not be constructed until final closure activities are initiated.

As mentioned in the Closure Plan (Section 4.0), the final configuration of the closed landfill includes three parallel ridges running east-west across the property, separated by two interior drainage swales. Flows from the interior drainage swales are directed into an interior perimeter drainage channel and routed off-site. The internal drainage swales and interior perimeter channel will grade at approximately one percent downhill and to the west. The two internal drainage swales are intercepted halfway across the site by the middle drainage which will direct run-off water from the final closed surface south down the middle and off-site. A detail and cross sections of the middle drainage channel are included on Drawing C-2 (Appendix I). A 24-inch corrugated metal pipe culvert (culvert #3) will route flow from the middle drainage channel under the perimeter access road off-site to the south. Run-off flows from the western half of the property will flow from the drainage swales into the interior perimeter drainage channel, and then off-site through culverts #1 and #2, as illustrated on Drawing C-1. Culverts #1 and #2 are also designed as 24-inch corrugated metal pipes.

An exterior perimeter drainage channel will be constructed during the active life of the facility along the northern and eastern site boundary. The drainage will intercept any potential run-on flow and redirect it around the closure cap and off-site. As illustrated on Drawing C-1 (Appendix I), run-on flow will be redirected off-site into adjacent natural drainages.

7.7 CLOSURE AND POST-CLOSURE DESIGN, CONSTRUCTION, AND MAINTENANCE

A detailed discussion of closure and post-closure design, construction, and maintenance is included in Sections 4.0 and 5.0 of this application. The post-closure land use of the property, because of its remote location, is likely to be open range. However, the perimeter fence will remain in place until the completion of the post-closure care period.

8.0 REFERENCES

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